Pearson Edexcel

Examiners' Report

Principal Examiner Feedback

Summer 2025

Pearson Edexcel GCSE (9 – 1)
In Mathematics (1MA1)
Foundation (Calculator) Paper 3F

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GCSE (9–1) Mathematics 1MA1
Principal Examiner Feedback – Foundation Paper 3
Introduction

This paper covered a broad range of the specification and allowed responses to demonstrate understanding across different levels of demand. Many responses showed success in the earlier questions, where marks were often gained with confidence.

Responses tended to be strongest on questions involving numerical processes, such as Q6 (money problem), Q18 (percentages problem), and Q20 (calculator use). Questions that included a context presented more difficulty. Identifying key information and applying appropriate mathematical methods remains an area for development. Questions requiring written explanations, such as Q10 and Q23a, were generally answered less successfully and may benefit from further focus.

Calculator use was evident in many responses, and this appears to support improvements in the standard of accuracy. However, some responses did not show evidence of calculator use. It is unclear whether this was a deliberate choice or due to lack of access to equipment. There were fewer blank responses compared to previous years.

Areas of the specification requiring further development are listed at the end of this report.

Report on individual questions

Question 1

A variety of formats were accepted for the correct answer such as tenths, 7 tenths, $\frac{7}{10}$ and 0.7 and these were all seen often. Common incorrect answers were 700, hundredths and 7 hundredths.

Question 2

2.4 was the most common correct answer but some responses gave an answer of $\frac{12}{5}$ which was also accepted for 1 mark. Common incorrect answers were 2.88 and 24.

Question 3

The most common correct answer was $\frac{19}{100}$ but some response also gained B1 for an answer of $\frac{190}{1000}$. The most common incorrect answers were 0.19, $\frac{1.9}{10}$ and $\frac{1}{19}$.

Question 4

The most common correct form for the answer was $\frac{4}{10}$ but an alternative equivalent form was also accepted such as $\frac{2}{5}$, 0.4 or 40%. As long as the answer line was blank, it was also acceptable to positively indicate $\frac{4}{10}$ in the list e.g. by circling, underlining or using an arrow to point at it. The most common incorrect answers were $\frac{3}{9}$, $\frac{5}{15}$ and $\frac{6}{18}$.

Question 5

For responses that gained B1, a variety of correct factor pairs were provided. In some cases, more than two factors were listed; this was accepted as long as all factors given were correct. Some responses presented the pair of factors as a product, which was also accepted. The most common incorrect responses included pairs of multiples of 32 or pairs of numbers with a sum of 32.

Question 6

Most responses that gained 3 marks followed the method outlined in the main mark scheme: calculating the value of the £20 notes (£120), then the value of the £10 notes (£280), and giving a final answer of 28. Build-up methods were used less frequently and with mixed success. This approach involved counting in multiples of 20 to reach £120, then continuing in steps of 10 until £400 was reached. If this process was completed with only one error, P2 could still be awarded. Alternative formats of the answer 28 were accepted, including £28, 28 £10 notes, and 28 × £10. Some responses gained 2 marks by reaching £280 but did not continue further. Others gained 1 mark for reaching £120 but either stopped or made an error in the next step.

A number of responses used £200 instead of £400 due to misreading the question. These could still be awarded both P marks, in line with general marking guidance point 14. In some cases, the working correctly led to 28, but the answer line showed 280, meaning that the final A mark could not be awarded. It is important that the final answer matches the question requirement.

Question 7

For part (a), the expected response was a cross (×) placed at $\frac{1}{6}$, being the first mark to the right of 0. Common incorrect placements included a cross at 0 or at the second mark to the right of 0.

For part (b), the correct placement was a cross at $\frac{2}{6}$ being the second mark to the right of 0.

Common incorrect placements included a cross at the first mark to the right of 0, at 0, or at 1. In both parts, most responses placed the cross directly on the chosen mark on the line. Some placed the cross above or below the line; where the intended mark was clear, credit was awarded.

Question 8

To gain 2 marks, responses needed to include all 9 correct combinations without any errors or repeats (e.g. CB and BC). Alternative notation was accepted, such as C + B, C and B, C/B, or Coffee-Brownie. Some responses used formats other than a list, such as a two-way table; this was acceptable for full marks if all 9 combinations were correct.

Where 2 marks were not awarded, 1 mark was commonly given for at least 4 correct combinations. Errors included repeated combinations, one incorrect combination out of nine, or an incomplete set of combinations. Responses that gained 0 marks typically listed only one combination per drink (e.g. CB, TF, LS), resulting in just 3 combinations.

Question 9

In part (a), B1 was awarded for a response of (−2, 1). The most frequent incorrect response was (1, −2).

In part (b), B1 was awarded for marking point *D* at (1, 2) with a cross (×). Labelling was not required, provided there was no ambiguity, such as *D* being marked elsewhere on the grid. Some leniency was applied where the cross was not placed exactly at (1, 2); if this was the nearest point to the cross, the mark was awarded. The most common incorrect response was marking (2, 2).

In part (c), B1 was awarded for marking point *E* at (5, 0) with a cross (×). As with part (b), labelling was not required if the intended point was clear. Leniency was applied for placement near (5, 0), with the mark awarded if this was the closest point. Common incorrect responses included (5, 1) and (6, 0).

Question 10

There were several ways to gain 1 mark on this question, as outlined in the mark scheme. The most common accepted responses included those listed at the top of the Acceptable Reasons section, such as: “No, the cube root of 27 is 3 (not 9)”, “No, 9 × 9 × 9 is 729”, and “No, 3 × 3 × 3 is 27”. Responses that did not use the exact wording from the mark scheme were credited if the reasoning was equivalent or otherwise correct.

To gain C1, a decision was required. This could be stated explicitly as “No” or implied through phrases such as “Jason is wrong” or “He is not correct”. Some responses did not include a decision and therefore did not gain the mark.

Various incorrect responses were seen, including confusion between square roots and cube roots. The definition of a C (communication) mark should be noted: it is awarded for a fully correct statement with no contradiction or ambiguity. Some responses were unable to be awarded the C mark due to including an acceptable reason alongside an incorrect or conflicting statement.

Question 11

The most common correct method involved converting 1.2 metres to centimetres (120), followed by calculating 136 − 120 to give an answer of 16 and gain 2 marks. Some responses converted 136 centimetres to metres (1.36) and subtracted 1.20, resulting in an answer of 0.16; this gained 1 mark.

Other responses gained M1 for a correct conversion but did not complete the method accurately, so the A mark was not awarded. In some cases, 1 mark was awarded where an attempt was made to convert either Elena’s or George’s height, even if the conversion was incorrect, provided the difference was calculated using a value listed in the additional guidance of the mark scheme. Responses that did not include any conversion typically gained 0 marks.

Question 12

In part (a), B1 was awarded for a response of 11. Common incorrect responses included expressions such as $3n - 1$, $7n - 1$, and $12n - 3$, or numerical values such as -1, 7, and 42.

In part (b), there were several valid approaches to gain 2 marks. The most frequent correct method involved continuing the sequence to 63 and giving a correct decision of ‘yes’. Some responses used the nth term to show that 63 was the 10th term or that $n = 10$. It should be noted that stating the nth term $(6n + 3)$ alone was not sufficient for credit; it needed to be used, for example by setting it equal to 63, to gain M1.

Responses that continued the sequence but included errors could still gain M1 if at least three correct terms were shown. Common responses that did not gain credit included statements such as “yes, as $57 + 6 = 63$” or “yes, as I keep on adding 6 to reach 63”, which did not demonstrate that 63 is part of the sequence mathematically.

Question 13

The first two method marks could be awarded for using angle properties. The most common approach was to apply the rule for vertically opposite angles to find angle *BCD* (120°), followed by using the rule for angles in a quadrilateral to calculate the angle marked x (105°). Some

responses used angles on a straight line twice to find angles such as *BCE* (60°) and *BCD*, or used this method to find *BCE* and *DCF*, then applied the rule for angles at a point to determine angle *BCD*.

Three-letter notation was rarely used when labelling angles, although angles were often marked on the diagram. Some responses showed a misunderstanding of the angles on a straight line rule, incorrectly assuming that angles *BCD* and *ADC* sum to 180° because they lie on line *CD*.

The reasons given needed to match the method used. For credit to be awarded, the full underlined term from the mark scheme was required; abbreviations such as "quad" were not accepted in place of "quadrilateral". Providing correct geometric reasoning remains an area for improvement.

Question 14

In part (a), B1 was awarded for a bearing of 115°. Any value between 113° and 117° was accepted. Common incorrect responses included 50°, 65°, 90°, and 180°.

In part (b), the most frequent correct answer was 30. Two marks were awarded for any value between 29.2 and 30.8, allowing for the measurement of *CD* to fall within the range of 7.3 to 7.7. One mark was awarded where *CD* was measured accurately but either converted incorrectly or given without multiplying by 4. One mark could also be awarded where *CD* was measured outside the accepted range but then multiplied by 4, provided the measurement was clearly identified as *CD*, either by labelling on the diagram or stating it in the workspace.

Responses that gained 0 marks typically showed inaccurate measurement. A common example was $7 \times 4 = 28$, where 7 was not clearly identified as *CD*, resulting in no credit.

Question 15

In part (a), B1 was awarded for a correct fraction e.g. $\frac{87}{200}$ or an equivalent fraction. Common incorrect fractional answers included $\frac{43.5}{100}$, $\frac{87}{100}$, $\frac{89}{200}$ and $\frac{87}{111}$. It should be noted that a fraction was asked for in the question so if the answer was given in an alternative form such as a decimal or percentage, even if the correct fraction had been seen, B0 was awarded.

In part (b), B1 was awarded for an answer of 12. Common incorrect answers included 0.12, 0.24, 24 and 48. It should be noted that a percentage was asked for in the question so if the answer was given in an alternative form such as a decimal or fraction, even if the correct percentage had been seen, B0 was awarded.

Question 16

The most common correct method involved identifying the number of games won (18), subtracting this from 48 to find the number of games drawn and lost (30), and then dividing by 2 to reach the final answer of 15.

Some responses used fractional reasoning, calculating the fraction of games drawn and lost and multiplying this by 48 to obtain 30 before continuing. In cases where the response stopped at 30 and gave this as the final answer, 2 marks were awarded.

One mark (P1) could be awarded for correctly subtracting the number of games won from 48, provided the number of games won was clearly stated and an integer less than 48. For example, if a response calculated ¾ of 48 = 36, then did 48 − 36 = 12, the first process mark could be awarded.

Question 17

In part (a), 3 marks were awarded for correctly completing all 6 values in the frequency tree. Where fewer than 6 correct values were given, 2 marks could be awarded for at least 4 correct values, typically including 37, 83, 21 and 16 or 37, 83, 21 and 44. One mark was awarded for at least one correct value, such as accurately placing 37 or 21 (values provided in the question) into the frequency tree. A common error was to enter 65 and 18 as the final two values, often due to misreading the question and not recognising that "have a scooter" applied to two separate branches.
In part (b), B1 was awarded for a correct probability. If the frequency tree in part (a) was incorrect (e.g. 83 was not used), a follow-through mark was awarded if the probability matched the values used in that tree. Equivalent forms such as 0.69(...) or 69(...)% were accepted. However, values needed to be given to at least two significant figures, answers such as 0.7 or 70% were not awarded B1. If the answer was given as a percentage, the % symbol had to be included.

Question 18

The most common correct method for gaining 3 marks involved reducing £12,000 by 20% to get £9600, then dividing by 24 to reach £400. A decision was required for full marks, this could be stated as "Yes" or implied through an equivalent statement such as "Amy is correct" or "She is correct". Some responses did not include a decision or gave an incorrect one, resulting in the loss of the communication mark.
It was also common to see responses that calculated £9600 and compared it with the total of 24 monthly payments of £450 (£10,800). A few responses gained the first mark by dividing £12,000 by 24 to get £500 but rarely progressed to multiply by 0.8 or use an equivalent method to reach £400.

The definition of a communication (C) mark should be noted: it is awarded for a fully correct statement with no contradiction or ambiguity. Some responses were unable to be awarded this mark as they included a correct decision and correct values alongside an incorrect statement, such as "400 > 450" or "the difference is £60".
Responses that gained 0 marks often calculated 20% of £12,000 (£2400) but then attempted to work with this value directly, rather than subtracting it from £12,000.

Question 19

In part (a), B1 was awarded for an answer of 2. Common incorrect responses included 3, 7, and 9.
In part (b), full marks were awarded for calculating five correct products, summing them, and dividing by 50 to give an answer of 2.36 (2.4 was also accepted if supported by correct working). Two marks were awarded where five products were calculated with one or two errors, followed by summing and dividing by 50. One mark was awarded for at least three correct products, with the most frequent error being division by an incorrect value, typically 5 or 15.
It was common to see correct working shown in the table and workspace, worth 1, 2, or 3 marks, followed by abandonment of the method in favour of an incorrect approach such as $50 \div 5 = 10$, with 10 placed on the answer line. In line with general marking guidance point 4, these responses were awarded 0 marks.

Question 20

In part (a), 2 marks were awarded for an answer of 0.2650780261. Only the first three decimal places needed to be correct to gain full marks. Where 2 marks were not awarded, M1 could be given for a value listed in the mark scheme, most commonly the fraction 1257/4742 displayed directly from the calculator. Responses that gave an incorrect answer without any working were awarded 0 marks.
In part (b), B1 was awarded for an answer of 0.27. If the answer to part (a) was incorrect, a follow-through mark could be awarded if that value was rounded correctly to 2 significant figures, provided the original value had at least 3 significant figures. Common incorrect answers included 0.37 and 0.3.

Question 21

In part (a), B1 was awarded for an answer of y^8. Common incorrect responses included y^5 and y^{12}.
In part (b), B1 was awarded for an answer of e^6. Common incorrect responses included e^5 and 6.
In part (c), B1 was awarded for an answer of $3x^3 + 5x$. Common errors included incorrect terms such as $3x^2 + 5x$ or $3x^3 + 5$, or reaching a correct expansion but then continuing with incorrect algebra, for example $3x^3 + 5x = 8x^4$. As per general marking guidance point 7, such contradictions resulted in 0 marks.
In part (d), 2 marks were awarded for a correct answer of $n^2 + 3n - 10$. Where full marks were not awarded, 1 mark could be gained for either three out of four correct terms with correct signs,

or four correct terms ignoring signs. Both approaches were commonly seen. Frequent errors included sign mistakes, expanding to get $2n$ instead of n^2, or 3 instead of -10. It was also common to see $-2n + 5n$ simplified incorrectly as $7n$ or $-7n$, indicating difficulty with addition and subtraction involving negative numbers. Some responses included only two terms, such as $n^2 - 10$ or $5n - 2n$, which gained 0 marks. There were also responses that showed limited understanding of how to expand and simplify two brackets.

Question 22

To gain 2 marks, all five points needed to be plotted accurately and joined using straight line segments. Where full marks were not awarded, 1 mark could be gained for a frequency polygon with a single error. Common responses that gained 1 mark included:

- Accurate plotting of points but joined with a curve
- Accurate plotting of points but not joined
- One point plotted incorrectly
- First and last points joined directly
- All five points plotted at correct heights, consistent within the intervals (typically at end points), and joined with line segments

Responses that gained 0 marks often showed a lack of understanding of the frequency polygon method. Some produced a histogram or similar alternative. Others joined points in the wrong order, for example connecting the 1st to the 3rd to the 4th to the 5th, and then linking the 1st and 5th to the 2nd to form a triangle.

Question 23

In part (a), B1 was awarded for an answer of 2. Common incorrect responses included 3, 7, and 9.
In part (b), 2 marks were awarded for a correct factorised expression of $2xy(x^2 + 2y)$. One mark was awarded where two out of the three factors were correctly extracted, such as $2x(x^2y + 2y^2)$, $2y(x^3 + 2xy)$, or $xy(2x^2 + 4y)$. One mark could also be awarded for extracting $2xy$ and including one correct term within the bracket, for example $2xy(2x^2 + ...)$ or $2xy(... + 4y)$.
The most common incorrect response was $6x^4y^3$, which gained 0 marks. Responses that extracted only one factor from the expression also gained 0 marks.

Question 24

The most common fully correct method involved calculating the selling price of 200 oranges (£40), subtracting the cost price (£25) to find the profit (£15), then dividing by £25 and multiplying by 100 to reach a percentage profit of 60%.

Other valid methods listed in the mark scheme were seen but less frequently. Some responses gained 2 marks for reaching £15 or 0.6 but gave this as the final answer, stopping one step short. Others gained 1 mark for completing only the first step, such as calculating £15 or £40.
One mark (P1) was also awarded where £40 was correctly calculated, but the next step was incorrect, for example, dividing £25 by £40 instead of £40 by £25. Converting the profit into a percentage was the most common source of error.

Question 25

There were multiple valid approaches to reaching comparable values, with 12 examples listed at the end of the mark scheme. The most common correct method involved comparing the cost per pound in US dollars.
Where 4 marks were not awarded, some responses gained 3 marks by calculating correct comparable values but making an incorrect decision or rounding prematurely, resulting in inaccurate final values despite a complete process. The first two process marks were typically awarded for converting between kilograms and pounds (commonly using 2kg = 4.4lbs) and converting between pounds and US dollars (commonly using £3.75 = $4.50), although a range of conversions were seen for both weight and currency.
Further progress was limited in some responses due to uncertainty about how to scale 4.4lbs to 5lbs or vice versa. In these cases, some attempted to approximate or use differences, which did not lead to a complete correct method and therefore did not result in comparable values.

Question 26

To gain 2 marks, responses needed two correct bounds, 23.75 and 23.85. If 2 marks were not gained, 1 mark was often awarded for one correct bound, usually 23.75. It was common to see e.g. 23.84 or 23.849 for the upper bound; it should be noted that for the upper bound, 23.8499(9...) (e.g. minimum of two 9's) or $23.84\dot{9}$ (recurring symbol needed) were both accepted but 23.849 was not. Common incorrect answers for 0 marks included 23.7 / 23.9 and 23 / 24.

Question 27

To gain 3 marks, the correct method involved converting 2 hours 24 minutes to 2.4 hours and dividing 1512 by this value to reach an answer of 630. An alternative method, converting 2 hours 24 minutes to 144 minutes, dividing 1512 by 144, and then multiplying by 60, was valid but rarely seen. Some responses gained 1 mark for correctly converting to 144 minutes.

Where time was not converted accurately, 1 mark could still be awarded for dividing 1512 by a value the respondent believed represented the flight time. This approach was frequently observed.

Question 28

The most common fully correct method involved calculating the differences between the x-coordinates (6) and y-coordinates (5), dividing these by 2 to get 3 and 2.5, and then adding these to the coordinates of point B to give the final answer of (11, 14.5).
Two marks were awarded where one coordinate was correct, most often 11. One mark was awarded in two main ways: either by identifying the differences between coordinates (e.g. 6 and 5), which needed to be presented as a pair such as (6, 5) or (5, 6) if no working was shown; or by calculating the midpoint of AB as (5, 9.5), with one correct value and a clear process sufficient for P1.

Responses that started from the midpoint often did not progress further to find the coordinates of point C. Some responses gained P2 only, due to reversing the coordinates and giving (14.5, 11) as the final answer.

Question 29

The most common fully correct method involved calculating the length from point C to the point where the perpendicular from B meets line CD (labelled as x in the mark scheme), typically found to be 4 using the area of the triangle (16). This was then followed by applying Pythagoras' Theorem to find the length of BC and completing the process to reach the final answer.

Some responses correctly calculated the length of CD as 16 using the area of the trapezium and continued from there. Others attempted to work backwards using the trapezium area formula but incorrectly substituted values such as 12 and 8, for example: $\frac{1}{2}(12 + 8) \times h = 112$.

Two marks were awarded where either $x = 4$ or $CD = 16$ was correctly found, but the process was not completed or the perimeter was attempted without calculating BC. In some cases, BC was assumed to be 8 cm without justification.

Where the initial area-based method was not used, some responses assigned a value to x and applied a correct Pythagoras process, gaining the third and fourth process marks. One mark was also awarded for calculating the triangle's area (16) by subtracting the rectangle's area (96) from the trapezium's area (112).

Some responses incorrectly applied Pythagoras' Theorem using the lengths of AB and AD (12 and 8) to find BD, which did not gain credit. Use of trigonometry to find BC was rare.

Question 30

The most common fully correct method involved either multiplying the top equation by 3 and subtracting the two equations, or multiplying the bottom equation by 7 and adding the two equations. This step was the most challenging, and responses that completed it correctly generally went on to substitute the found value into one of the original equations and solve accurately, gaining 3 marks.

Responses that gained 0 marks often did not make a correct start, typically attempting to work with the equations as given without applying multiplication, or using trial and improvement methods, which were rarely successful. In some cases, multiplication was carried out correctly, but the next step was not executed accurately, or the wrong operation was chosen to eliminate a variable.

Where correct values of $x = 3.5$ and $y = 1.5$ were given without supporting working, either absent or incorrect, Special Case B1 was awarded.

Summary

Based on the performance on this paper, learners/centres should:

- note the definition of a C (communication) mark, it is awarded for a fully correct statement with no contradiction or ambiguity; a correct answer/statement given with an incorrect statement will be awarded C0
- ensure a decision is made in questions that require one
- note that for credit to be given for geometric reasons on angle questions, learners must give the whole underlined word in the mark scheme and abbreviations will not be accepted, e.g. ‘quad’ is not acceptable for ‘quadrilateral’. Reasons should also be learned
- encourage learners to show confidence in their original method and not abandon it for an incorrect method (e.g. when finding the mean from a frequency table Q19b)
- always show each step of their method
- practise finding the value of a digit in a number
- practise finding a bearing by measuring with a protractor and measuring a line accurately using a ruler
- ensure method is shown when calculating percentages e.g. not just writing 10% = ...
- practise finding percentage profit once the value of the profit has been found
- practise finding the median and mean from a frequency table
- practice expanding and simplifying double brackets
- practise changing the subject of an equation
- practise using unitary processes to compare values in best value problems
- not truncate or round values part way through a process
- practise finding the limits for error intervals
- practise converting times in hours and minutes into hours only
- practise problems involving area and Pythagoras’ Theorem
- practise solving linear simultaneous equations

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